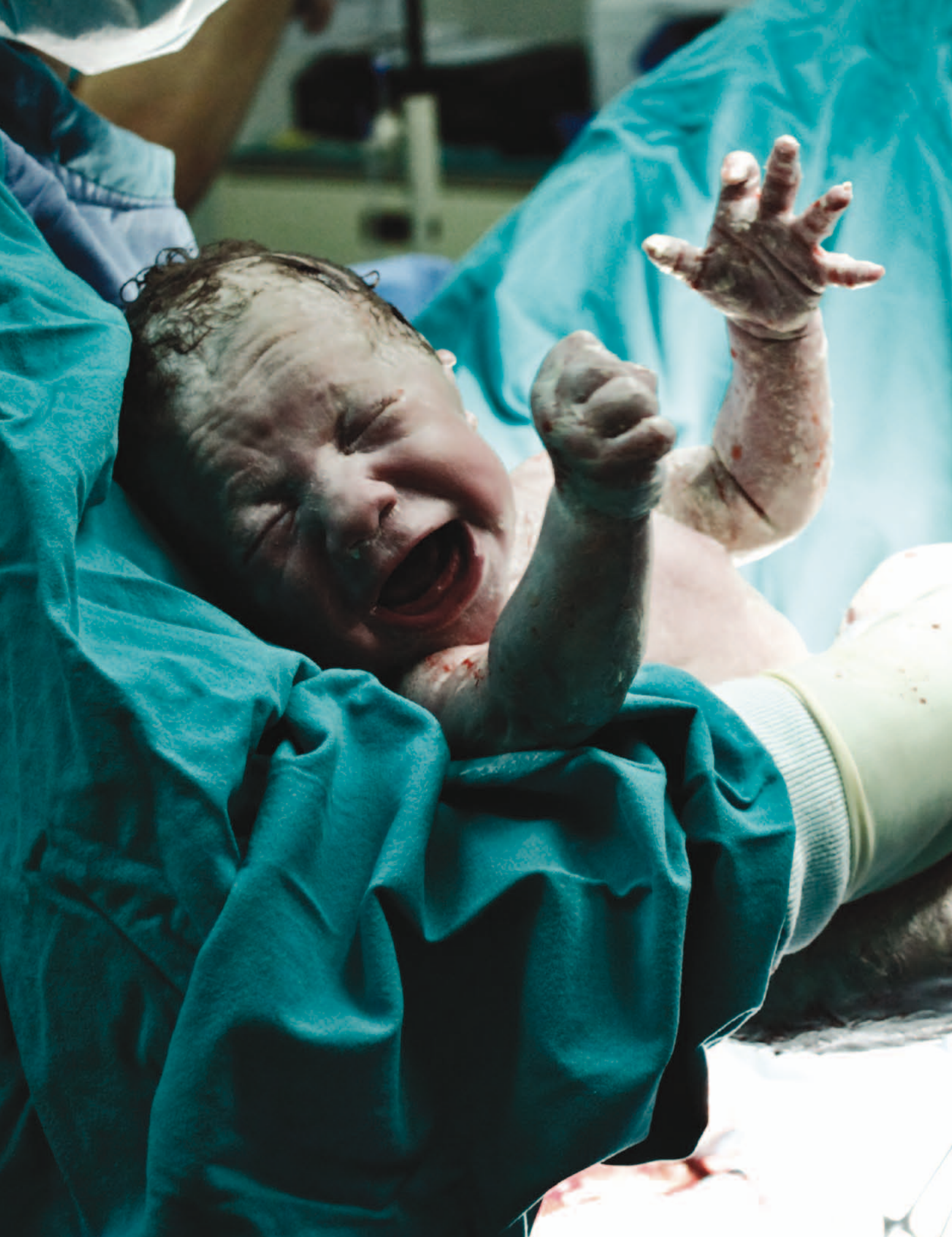

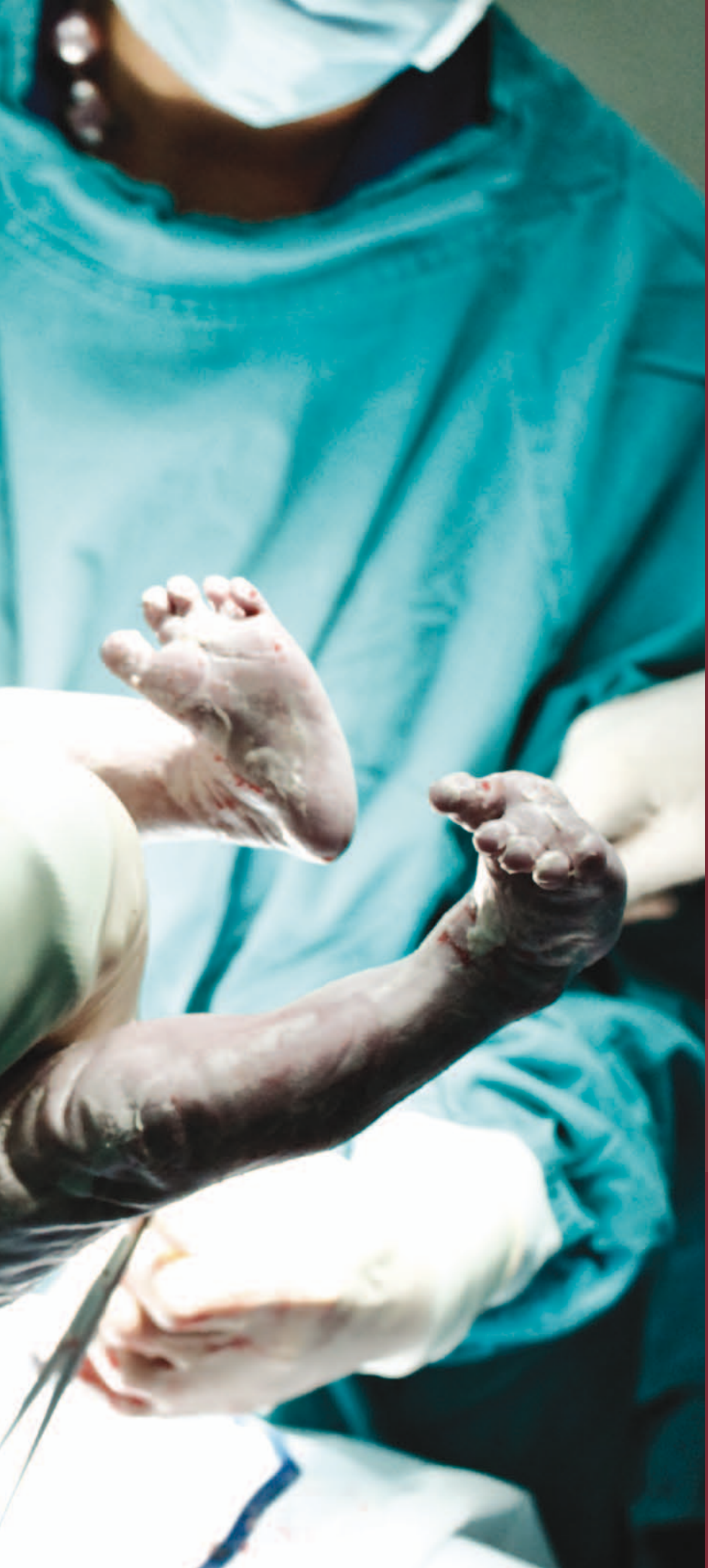

ONE

Elective Cesarean Delivery

Trends, Evidence and Implications for Women, Newborns and Nurses

Candace Campbell,
MSN-HCSM, RN

Objectives

Upon completion of this activity, the learner will be able to:

1. Cite recent trends in cesarean delivery in relation to maternal, neonatal and familial outcomes.
2. Differentiate ethical considerations involved in decision-making about nonemergent, elective cesarean delivery based on maternal and fetal outcomes.
3. Discuss measurable outcomes that would be expected to result from decreasing the cesarean delivery rate in the U.S.

Continuing Nursing Education (CNE) Credit

A total of 1 contact hour may be earned as CNE credit for reading "Elective Cesarean Delivery: Trends, Evidence and Implications for Women, Newborns and Nurses" and for completing an online post-test and participant feedback form.

To take the test and complete the participant feedback form, please visit http://journalscne.awhonn.org/. Certificates of completion will be issued on receipt of the completed participant feedback form and processing fees.

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INTRODUCTION

Cesarean delivery (CD) is the most frequently performed surgical procedure in the United States (Russo, Wier, & Steiner, 2009). The rate of CD in the United States has climbed from less than 5 percent in the 1960s to 31.8 percent in 2007 (Menacker & Hamilton, 2010). From 1996 to 2007, CD rates increased in all U.S. states, and by more than 70 percent in six states (Cunningham et al., 2010; Menacker & Hamilton). The CD rate rose by 53 percent from 1996 to 2007, reaching 31.8 percent, the highest rate ever reported in the United States (see Figure 1), representing a total of approximately 1.4 million operations. CD rates among the five largest racial/ethnic groups are reported to be the following: blacks (34 percent), whites (32 percent), Asians/Pacific Islanders (31 percent), Hispanics (30 percent) and Native Americans (28 percent) (Centers for Disease Control and Prevention [CDC], 2010; Menacker & Hamilton).

Furthermore, 2010 reports of data gleaned from birth certificates recorded between 1991 and 2007 show an overall increase in primary CD rates, a coinciding decrease in vaginal birth after CD (VBAC), a 36 percent increase in infants born before 34 weeks by CD and a significant increase in late preterm infants (34-36 completed weeks gestation) born by CD (Menacker & Hamilton, 2010), which equals more premature births than term births by CD (see Figures 2 and 3).

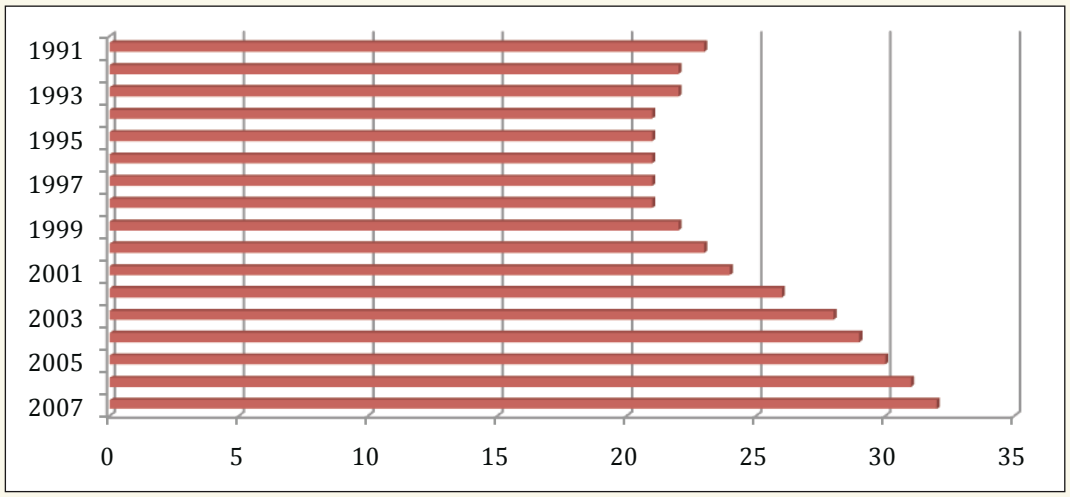
Bottom Line

- The rate of cesarean delivery in the United States rose 53 percent from 1996 to 2007.
- Evidence suggests that nonemergent elective cesarean delivery may have several negative outcomes for women, newborns and their families.
- Nurses play a key role in educating pregnant women about possible outcomes of cesarean delivery.

While obstetric interventions, including CD, are often warranted, a growing body of evidence suggests that nonemergent, primary elective cesarean delivery (ECD) and nonemergent, elective repeat cesarean delivery (ERCD) may have several negative outcomes for women, newborns and their families (Ehrenthal, Jiang, & Strobino, 2010).

This article focuses on the latest research on the complex issues surrounding primary ECD and ERCD. Clinical indications, ethical considerations, familial impact, economic impact and long-term ramifications of primary ECD on women and newborns will be discussed. Recommendations for outcomes management and nursing interventions are included.

FIGURE 1 **PERCENTAGE RATE OF CESAREAN DELIVERIRES IN US: 1991–2007**



Percentages figured on the accelerant curve. In 2007, the cesarean rate reached 32%, which was the highest ever reported in the United States. Cesarean births increased in all US states, and by more than 70% in six states from 1996–2007.

Source: CDC/NCHS, National Vital Statistics

PREDICTORS AND RISK FACTORS

The main predictors of increased CD rates (and preterm births)—whether medically indicated, ECD or ERCD—in both nulliparous and multiparous groups include the following:

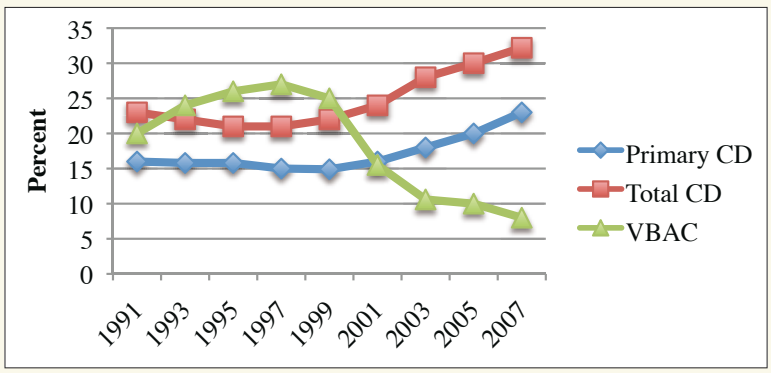
- labor induced before 39 weeks,
- maternal age over 35 years,
- use of assisted reproductive technology (ART),
- multiple gestation pregnancies.

Other factors include pregnancy-induced hypertension, pre-eclampsia, HELLP syndrome and preexisting medical problems such as obesity, diabetes and hypertension (CDC, 2010; Reddy, Wapner, Rebar, & Tasca, 2007).

Recent U.S. government reports point to the increased use of induction and CD between 34 and 36 weeks gestation as influencing the increased prevalence of late preterm birth (Martin, Kirmeyer, Osterman, & Shepherd, 2009) (see Figure 4). What is unclear is how many inductions are emergent or nonemergent, and how many are requested by pregnant women.

It's well-documented that older mothers are often unable to carry to term, whether because of complications from physical problems, or because they're more likely to have a multiple gestation pregnancy, or both (CDC, 2010). A comparison of preterm birth rates by maternal age from the past 18 years reveals that as more women delay childbearing, the preterm birth rate rises (Martin, Osterman, & Sutton, 2010) (see Figure 5).

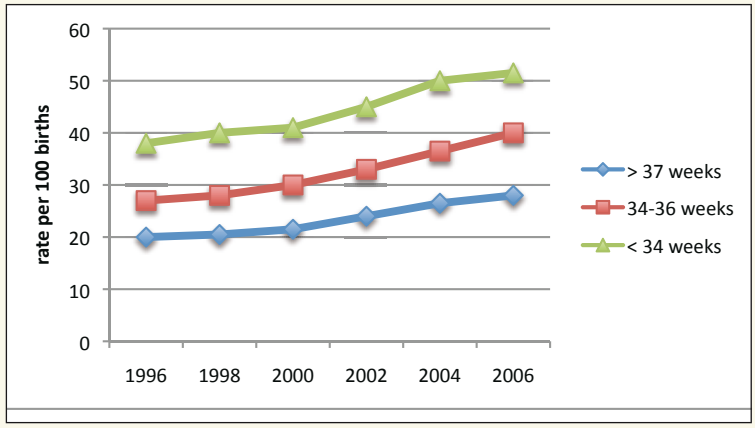
FIGURE 2 **1991–2007 U.S. CESAREAN DELIVERY RATES BY CATEGORY: PRIMARY CD, VBAC, TOTAL CD**



1991–2007 Figure shows trends for delivery rates based on information gathered from birth certificates.

Source: CDC/NCHS, National Center Health Statistics

FIGURE 3 **US CESAREAN RATE BY GESTATIONAL AGE**



Cesarean rates were higher for early preterm and late preterm infants than for term births.

Source: CDC/NCHS, National Center Health Statistics (Menacker & Hamilton, 2010)

Although reliable estimates of specific use of fertility drugs are not available, the CDC has been collecting data on ART (e.g., in vitro fertilization with transcervical embryo transfer, intracytoplasmic sperm injection, gamete and zygote intrafallopian transfer) since 1992 (CDC, 2010). Predictable side effects of ART include risk of preterm delivery and associated low or very low birth weight (largely because of the elevated risk of multiple gestation pregnancy), as well as an increased risk of adverse perinatal outcomes among singleton infants born with ART compared with those conceived without ART (CDC).

Because of variances in coding and definition, data sets comparing primary ECD and ERCD with vaginal birth are difficult, if not impossible, to assess

Rising rates of CD have been concomitant with rising rates of multiple births; between 1980 and 2004 the twin birth rate rose 70 percent; between 1980 and 1998, the triplet(+) birth rate climbed more than 400 percent (National Institutes of Health [NIH], 2008). The potential negative effects of multiple gestation pregnancy on maternal organ systems are numerous, and as stated, often result in CD.

CHALLENGES IN ASSESSING DATA

Because of variances in coding and definition, data sets comparing primary ECD and ERCD with vaginal birth are difficult, if not impossible, to assess. For example, physician use of the "unspecified" or "miscellaneous" code includes many variables. Birth information delineating ECD based upon subjective criteria, that is, *maternal exhaustion* or *trial of labor before CD*, is not always available (CDC, 2010; Latham & Norwitz, 2009). Neither hospital discharge records nor birth certificates record information about maternal preferences for delivery nor about the process of decision-making that leads to the CD choice, be it ECD or ERCD. To date, there have been no randomized clinical trials comparing these birth methods. Because of the number of variables, all information from nonrandomized trials or analysis of birth records are open to bias and are not generalizable (NIH, 2008).

MATERNAL IMPLICATIONS

As with any major abdominal surgery, CD involves inherent risks of mortality and morbidity for both mothers and neonates. Complications are known to occur both in the immediate hospitalization and after discharge, with some patients requiring readmission. These include hemorrhage necessitating transfusion (as opposed to postpartum vaginal hemorrhage, which is nearly as common but does not as often require blood transfusion), fever, infection, pneumonia, thromboembolic incidents, psychological sequelae, increased length of stay and ICU admission. Problems with subsequent pregnancies are also well-documented, including life-threatening hemorrhage and morbidity, especially related to placental problems (e.g., percreta, accreta, previa and abruption) (Caughey, 2009; Declerq et al., 2007; Martin et al., 2009; Menacker, MacDorman, & Declerq, 2010; Silver, 2010). An NIH report (2008) noted that other possible incidental complications from surgery (e.g., damage to bladder, ureters and other inner-abdominal structures) were shown to be more common after a difficult labor necessitating CD.

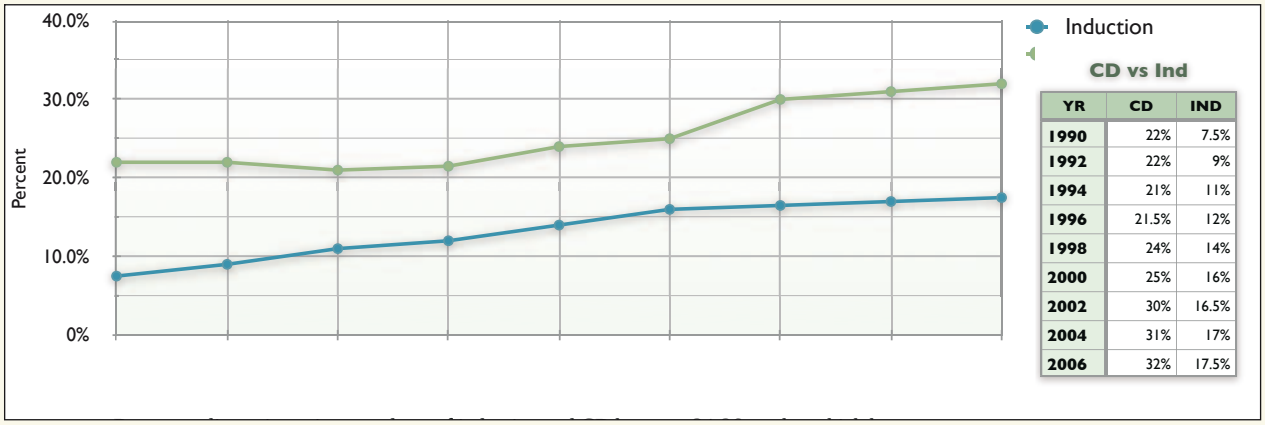
Additionally, the CDC reports that four medical pregnancy risk factors continue to complicate all modes of delivery and increase risk of CD with resultant postoperative complications. These are pregnancy weight gain of greater than 40 pounds, diabetes during pregnancy, pregnancy-associated hypertension and chronic hypertension (CDC, 2010).

The reported benefits of planned CD for the mother include decreased pelvic floor trauma (i.e., no episiotomy or lacerations), absence of labor pain and convenience (Williams, 2008).

NEONATAL IMPLICATIONS

The NIH (2008) has reported an increase in NICU admissions for all gestational age infants after CD. Clinical problems commonly found include hypoglycemia, hyperbilirubinemia, res-

FIGURE 4 1990–2006 US INDUCTION OF LABOR AND CESAREAN DELIVERY RATES IN LATE PRETERM BIRTHS



YR	CD	IND
1990	22%	7.5%
1992	22%	9%
1994	21%	11%
1996	21.5%	12%
1998	24%	14%
2000	25%	16%
2002	30%	16.5%
2004	31%	17%
2006	32%	17.5%

Recent studies point to increased use of induction and CD between 34–36 weeks, which has influenced the increase in late preterm birth rates.

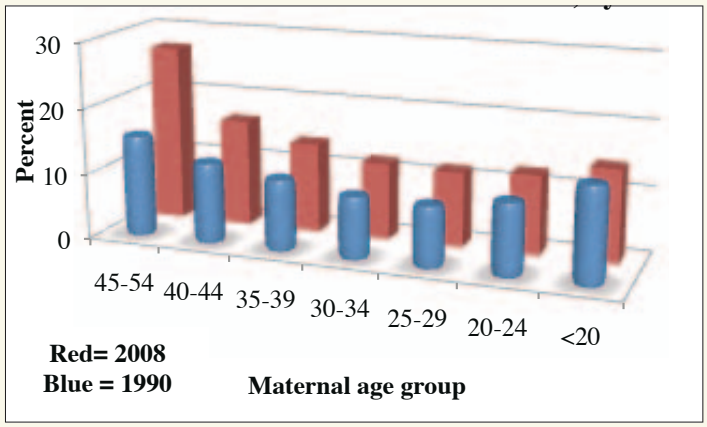
Source: CDC/NCHS, National Center Health Statistics

piratory problems (e.g., transient tachypnea of the newborn and respiratory distress syndrome) and infection (Patel & Jain, 2010). Researchers suggest that the increasing use of induction of labor and/or ECD before 39 weeks gestation has influenced the increase in the late preterm infant population (Martin et al., 2009).

Late preterm infants are at greater risk for the above-listed problems, as well as for persistent pulmonary hypertension of the newborn, temperature instability, feeding difficulties, pneumonitis, type 1 diabetes and severe hyperbilirubinemia (Hansen, Wisborg, Uldbjerg, & Henriksen, 2008; Martin et al., 2009; O'Shea, Klebanoff, & Signore, 2010; Patel & Jain, 2010). O'Shea et al. and Patel and Jain point to new evidence of CD complications for this age group regarding gastrointestinal problems (e.g., altered flora colonization of the gut, which may lead to altered immune function), which may result in increased risk of asthma later in childhood. These authors also report a lower rate of initiation of breastfeeding associated with CD, which alters the overall maturation of immune functioning and can contribute to childhood asthma.

While it is recognized that very-low-birthweight infants (less than 2,500 grams) may have any or all of the aforementioned problems, as well as bronchopulmonary dysplasia, chronic lung disease, retinopathy of prematurity, necrotizing enterocolitis, intraventricular hemorrhage, polyventricular leukomalasia, cerebral palsy, developmental delays and/or mental retardation, findings from a large California-based cohort study involving infants born after 30 weeks gestation (and weighing greater than 2,500 grams) yielded notable informa-

FIGURE 5 1990 VS 2008 : PRETERM BIRTH RATES, BY MATERNAL AGE



Comparison of preterm birth rates between decades. Data show trend in past 18 years. As more mothers delay childbearing, the preterm birth rate rises.

Source: CDC/NCHS, National Center Health Statistics (Martin et al. 2010).

tion about cerebral palsy, developmental delays and mental retardation (Ramachandrappa & Jain, 2009). Compared with term infants, late preterm infants were three times more likely to be diagnosed with cerebral palsy. There were also marginally higher risks for developmental delays and mental retardation in late preterm infants compared with term infants (Petrini et al., 2009).

Obstetric care involves the ethical paradox of treating two patients simultaneously. One patient enjoys complete autonomy, while the other is completely dependent

According to MacDorman and Matthews (2009), the reported benefit of a planned CD for the neonate is decreased rate of brachial plexus and cephalic injury, and decreased stillbirths. However, their study compared the stillbirth rate between infants born with primary nonemergent ECD and those born from planned vaginal births; they found the neonatal mortality rate for ECD was 2.3 times higher than for vaginal births (MacDorman & Matthews).

INDICATIONS FOR INTERVENTION

Aside from classic high-risk labor indications (malpresentation or malposition, non-reassuring heart rate, placental abnormalities, maternal health risks, cephalopelvic disproportion), dystocia is named as the number one reason for nonemergent ECD (Zhang et al., 2010). Unfortunately, dystocia is a relative term, once defined by the 1954 Friedman curve, and lately challenged by Zhang, Troendle, and Yancey (2002). Obstetric personnel often disagree as to the severity of dystocia in any given case. The American College of Obstetricians and Gynecologists [ACOG] intermittently proposes guidelines for practitioners, but even those vary as research changes (ACOG, 2004, 2010).

In both primary and repeat CD cohorts, the rate of nonmedically indicated CD continues to escalate for a number of reasons (Williams, 2008). Whether because of litigation trends, health plan payment policies, or shifting patient preferences, in the years following the 2004 ACOG policy recommendation regarding the availability of VBAC (which suggested that health care organizations should provide in-house obstetrical teams in case of emergent CD), VBAC declined and CD increased. This shift specifically affects smaller or more isolated hospitals that lack the funds to employ in-house obstetric teams immediately available to provide emergency care (ACOG, 2004; Roberts, Deutchman, King, Fryer, & Miyoshi, 2007). Macones (2010) offers evidence to suggest that the majority of cases of failed VBAC may be related to the method of medical management, and cautions against induction before 41 weeks. The report of the 2010 NIH Consensus Development Conference on VBAC (Cunningham et al., 2010) indicates that a trial of labor for women with one prior low-transverse uterine incision is a reasonable option, and ACOG, in a 2010 Practice Bulletin, states that, "most women with one previous cesarean delivery with a low-transverse incision are candidates for and should be counseled about VBAC and offered a trial of labor" (ACOG, 2010, p. 8).

ETHICAL CONSIDERATIONS

Obstetric care involves the ethical paradox of treating two patients simultaneously. One patient enjoys complete autonomy, while the other is completely dependent. Generally, both patients' best interests are in alignment, but there are times when the best interests of one supersede those of the other. When that happens, an ethical dilemma ensues.

Inherent with the health care providers' ethical responsibility for patient care is the lawful requirement to fully inform the patient of the risks, benefits and alternatives available in any particular situation (Cunningham et al., 2010). The legal aspect of medical ethics evokes a delicate balancing of triplicate concepts, each on a continuum—paternalism versus autonomy, beneficence versus nonmalfeasance and justice versus injustice—which must be considered when counseling pregnant women (McGrath & Phillips, 2009). Ethical management should include discussions pertaining to the latest data surrounding the risks and benefits of nonemergent CD (Latham & Norwitz, 2009).

In addition to discussing potential clinical outcomes, health care providers should also discuss with pregnant women the potential psychosocial results of any CD, including increase in maternal perceptions of poor birth experience, delayed family bonding, possible difficulty initiating and maintaining breastfeeding and lengthy recovery time (Caughey, 2009).

In the spirit of nonmalfeasance (*to do no harm*), a provider might lean toward paternalistic defense of the repeat CD choice, or acquiesce that the choice of primary ECD is an autonomous decision to be made by the mother (Latham & Norwitz, 2009). However, prospective parents should be educated on the other evidence as well—that primary CD is associated with a 47 percent increased risk of placenta previa, 40 percent increased risk of placental abruption in second pregnancy with a singleton, and associated hemorrhage (Silver, 2010; Yang et al., 2007). Long-term effects include chronic pain from scar tissue and adhesions (Silver). Both the American College of Nurse-Midwives (ACNM) and the International Federation of Gynecology and Obstetrics (FIGO) have published statements stating that primary ECD for nonmedical reasons is not ethically justified (ACNM, 2010; FIGO, 2009).

NATIONAL CONTEXT

As stated earlier, variations in coding and reporting make it difficult for researchers to succinctly measure data to determine the frequency of primary ECD in health care organizations (Latham & Norwitz, 2009). However, evidence suggests that increased morbidity and mortality rates for both maternal and newborn populations can be linked to primary ECD (Kamath, Todd, Glazner, Lezotte, & Lynch, 2009; NIH, 2008). Notable results include the conclusion that rates of NICU admission were similar in ERCD (with or without onset of labor) and failed VBAC deliveries requiring emergency CD. Also, as reported by Kamath et al., neonates born by successful VBAC had the least amount of respiratory problems requiring initial clinical support or NICU admission. Therefore, it can be deduced that interventions to decrease CD would decrease CD-related NICU admissions. Decreased NICU admissions would decrease the mean overall costs to patients, and society at large.

INTERNATIONAL CONTEXT

The United States is not the only nation with increased rates of CD. A survey of hospital and clinic births in nine Asian countries found an average of 27 percent CD (MacDorman & Matthews, 2009). In several South American countries and China, the percentage was nearly half of all births (Lumbiganon et al., 2010; Ma, Norton, & Lee, 2010; Villar et al., 2007). A startling World Health Organization (WHO) report found that, worldwide, medically unnecessary CD appears to encompass a large share of global economic resources; cost of the global excess CD was estimated to amount to approximately $2.32 billion (Gibbons et al., 2010). Economic strain serves as a barrier to universal coverage with necessary health services in some countries and, therefore, has important negative implications for health equity both within and across countries (Gibbons et al.).

Based on the research of Gibbons et al. (2010) for the WHO, countries with CD rates less than approximately 10 percent were also found to have less than intact and equitable health care systems for their citizenry (Gibbons et al.). On the other end of the scale, those countries with CD rates exceeding 15 percent were found to perform a high rate of medically unnecessary CD. The report concludes that there is an urgent need to set national overall CD goals between 10 percent and 15 percent.

ECONOMIC IMPACT

According to Behrman and Stith Butler (2007) for the Institute of Medicine, the median cost of hospitalization with CD cases is roughly double that of spontaneous vaginal birth. This does not account for the added cost of lengthened maternal recovery time, childhood early intervention or special education (see Figure 6). There is also a qualitative price paid with psychosocial effects that accompany interruption of familial bonding and difficulty establishing breastfeeding. As already established, since 1996, the rate of CD has remained higher for preterm births than for term births (Menacker, MacDorman & Deqlerc, 2010). The latest estimate of overall cost of premature deliveries in the United States is $26 billion a year (Behrman & Stith Butler, 2007).

FIGURE 6 **$26 BILLION ESTIMATED ANNUAL COST OF PREMATURITY IN U.S.**

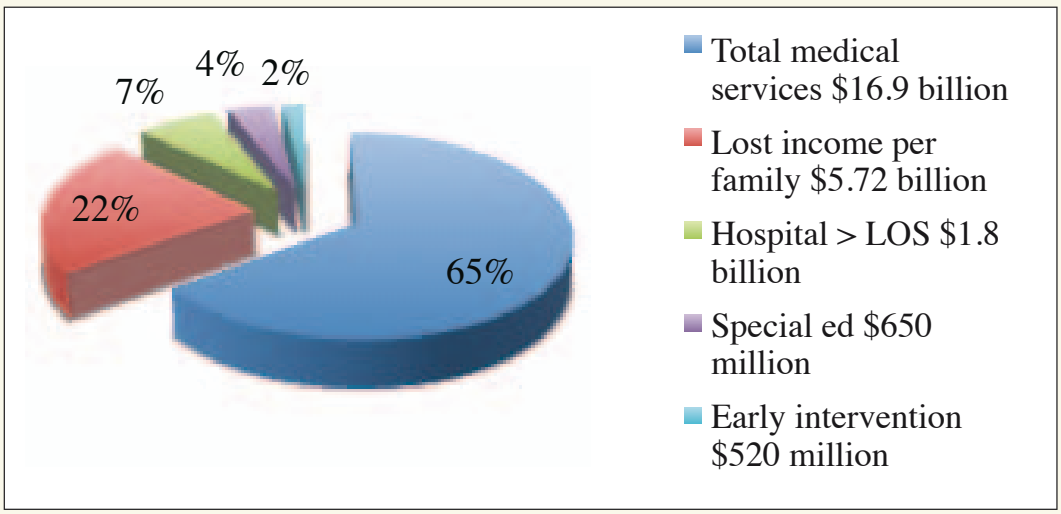


Figure shows estimated annual cost of prematurity in U.S. by category, as of 2006.

Source: IOM (Behrman, R. E., & Stith Butler, A., 2007).

RECOMMENDATIONS AND FURTHER RESEARCH

One of the goals of *Healthy People 2020* is to reduce maternal illness and complications due to pregnancy, including complications during hospitalized labor and delivery (Department of Health and Human Services, 2009). Outcomes of decreasing the CD rate could be measured clinically, functionally, financially and psychosocially and would support the *Healthy People 2020* goal.

Clinical Outcomes Goals

Measurable clinical outcomes that reflect the *Healthy People 2020* objectives might include a projected decrease of 10 percent primary and repeat CD, and an increase of 10 percent VBAC, within the United States. Achieving those goals should effectively cause a cascade of desired outcomes (Martin et al., 2010), including reduced postpartum length of stay, decreased number of maternal blood transfusions, reduction in postpartum wound infections, reduction in number of late preterm births and concomitant reduction in NICU admissions. Because collection of data on CD postpartum clinical outcomes varies widely from state to state, further research and evaluation is needed.

Functional Outcomes Goals

Measurable functional outcomes might include a movement toward increased overall maternal/newborn health, as evidenced by a 10 percent decreased incidence of postpartum depression and rehospitalization (for both mothers and neonates), and decreased rates of infant developmental delays and mental retardation (Agency for Healthcare Research and Quality [AHRQ], 2003).

Financial Outcomes Goals

Beneficial financial outcomes would be expected if recommendations regarding ECD were implemented. Appropriate and measurable goals for 2020 might include a 10 percent decrease in treatment costs (inpatient, plus outpatient charges), as evidenced by a minimum of 10 percent decrease in costs derived from each of the following categories: shortened maternal length of stay (and concurrent charges for complications, such as postoperative infections), fewer NICU admissions (including decreased infections and other aforementioned complications), and a decrease in ancillary family costs related to the birth, measured by decreased time off work and decreased expenditures on child care, parking, meals, special equipment, etc. Unfortunately, at present, only limited types of cost analysis data (data instruments are calculated differential statistics and vary greatly, depending on the case) are available for study on any level (Wapner & Jain, 2008).

Psychosocial Outcomes Goals

According to AHRQ (2010), the most appropriate and measurable psychometric measures presently available in this area are patient satisfaction surveys. No research exists involving a study that measures satisfaction for the types of delivery outcomes, including ECD, VBAC or trial of labor followed by CD or ERCD. However, an AHRQ report (2003) indicates a strong desire of parents to realize complete and effective bonding with neonates at time of birth, and an overriding dissatisfaction with the interruptions in bonding that can occur because of the clinical component of concurrent birthing and major surgery. Because primary care providers most often report survey results 30 days or more after birth, AHRQ researchers note the interval between birth and reporting events introduces the possibility of measurement bias. Shorter measurement intervals and more specific survey tools are needed.

Outcome Measures

More research also needs to be done to develop cost analysis measurement tools that would afford greater generalizability. Examples of valid and reliable instruments needed to formulate meaningful outcomes evaluations include data regarding type of delivery and postpartum and neonatal outcomes. A partial list of outcomes would include the following:

- uterine rupture
- wound dehiscence
- blood transfusion
- number of NICU admissions from CD versus trial of labor, failed trial of labor and VBAC births
- number of post-CD neonates who transitioned in the NICU for less than 24 hours
- number of post-CD NICU patient days on ventilator versus continuous positive airway pressure
- incidence of bronchopulmonary dysplasia related to type of delivery
- post-CD NICU length of stay and costs compared with vaginal birth
- post-CD high-risk infant follow-up (HRIFU) clinic outcomes
- and post-CD NICU HRIFU referrals to other ancillary specialists for follow-up

IMPLICATIONS FOR NURSES

Women's health, obstetric and neonatal nurses are challenged to deal with a growing body of knowledge regarding the impact of CD and ECD on families. Nurses must become educated about research findings and national specialty organization recommendations to be able to address their patients' questions and concerns. Because nurses function as patient advocates and enjoy public trust, we're in a position to advocate for better understanding of ECD and ERCD among our patients. This may be a challenge, as some women choose ECD as a solution to labor pain as well as for freedom to choose the time and place of

Get the Facts

American College of Nurse-Midwives
http://www.midwife.org/

American Congress of Obstetricians and Gynecologists
http://www.acog.org/

Association of Women's Health, Obstetric and Neonatal Nurses
http://www.awhonn.org/

Healthy People 2020
http://www.healthypeople.gov/

National Child and Maternal Health Education Program
http://www.nichd.nih.gov/ncmhep/focus/

NIH Consensus Development Conference on Vaginal Birth After Cesarean
http://consensus.nih.gov/2010/vbac.htm

birth (D'Angelo, 2003). Hospital nurses may feel that their part in the process occurs too late to influence change. However, all maternal health nurses can effect change by contributing to the formulation of hospital and clinic policies, developing needed measurement tools for further research, writing articles and integrating this information into labor and delivery classes and seminars.

CONCLUSION

CD rates have risen in recent decades and CD is often medically warranted. However, evidence shows that ECD and ERCD may have numerous negative outcomes for mothers, neonates and their families. A body of evidence documents possible psychosocial and physical complications for mothers and infants as a result of any CD, including those done for nonmedical reasons. Specific to recent studies is the evidence that neonates born via intended CD, with or without labor, have increased rates of prematurity, respiratory morbidity, neurodevelopmental delays and other disorders. The impact of CD on the family may result in increased maternal and neonatal length of stay in hospital, increased financial burden and decrease in breastfeeding initiation and family bonding.

Nurses can and must contribute to the ongoing research and discussion about the implications of nonemergent ECD. Through education of other nurses, patients and the general public, nurses can help facilitate the goals of *Healthy People 2020* and help decrease negative outcomes related to ECD. **NWH**

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Post-Test Questions

Instructions: *To receive contact hours for this learning activity, please complete the online post-test and participant feedback form at* ***http://JournalsCNE.awhonn.org****. CNE for this activity is available* ***online only****; written tests submitted to AWHONN* ***will not*** *be accepted.*

1. In 2007, approximately how many cesarean deliveries occurred?
   a. 1.2 million
   b. 1.4 million
   c. 2.2 million

2. Predictable results of any cesarean delivery include:
   a. delayed bonding, problems breastfeeding, postpartum pain
   b. fever, hemorrhage, thromboembolitic incidents
   c. infection, higher rates of readmission for both mother and newborn

3. Late preterm infants are at greater risk for:
   a. bronchopulmonary dysplasia, retinopathy of prematurity, necrotizing enterocolitis and intraventicular hemorrahage
   b. hypoglycemia, hyperbilirubinemia and transient tachypnea of the newborn
   c. primary pulmonary hypertension, gastrointestinal problems, type 1 diabetes, asthma

4. Functional outcomes that could result from decreasing the cesarean delivery rate include decreased
   a. ancillary family costs
   b. autism rates
   c. postpartum depression rates

5. Which racial/ethnic group has the highest rate of cesarean delivery?
   a. Asian
   b. black
   c. white

6. What is the most common medical diagnosis named as cause for elective nonemergent cesarean delivery?
   a. dystocia
   b. placenta previa
   c. poor variability

7. Financial outcomes that could result from decreasing the cesarean delivery rate include
   a. decreased rates of mental retardation
   b. fewer NICU admissions
   c. increased patient satisfaction

8. Ethical concepts that need to be considered when counseling patients include:
   a. autonomy, beneficence, justice
   b. predictable outcomes, possible outcomes, financial outcomes
   c. risks, benefits, alternatives

9. Main predictors of increased rates of cesarean delivery and preterm birth include:
   a. dystocia, late decelerations, incompetent cervix and hypoxia
   b. fear of labor, physician influence and scheduling preferences
   c. use of assisted reproductive technology, maternal age, multiple gestation and induced labor before 39 weeks

10. Reported benefits of a planned cesarean delivery for a neonate are:
    a. decreased rate of cephalic and brachial plexus injury
    b. decreased rates of developmental delay and mental retardation
    c. decreased rates of fetal hypoxia and cerebral ischemia

11. Reported benefits of a planned cesarean delivery for mothers include:
    a. better postpartum sleep pattern
    b. increased perception of good birth experience
    c. patient autonomy

12. Neonates born by vaginal birth after cesarean (VBAC):
    a. have fewer respiratory complications requiring NICU admission
    b. have increased incidence of hip dysplasia
    c. weigh less than an infant of a first pregnancy

13. After primary cesarean delivery, subsequent pregnancies are known to have an increased rate of:
    a. ischiatic nerve damage
    b. paralytic ileus
    c. placental abnormalities

14. The overall cost of premature deliveries in the United States is estimated to be:
    a. $1.2 million
    b. $19 billion
    c. $26 billion

15. From 1991 to 2007 in the United States the rate of infants born before 34 weeks increased by:
    a. 21 percent
    b. 36 percent
    c. 52 percent